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FIG. 1

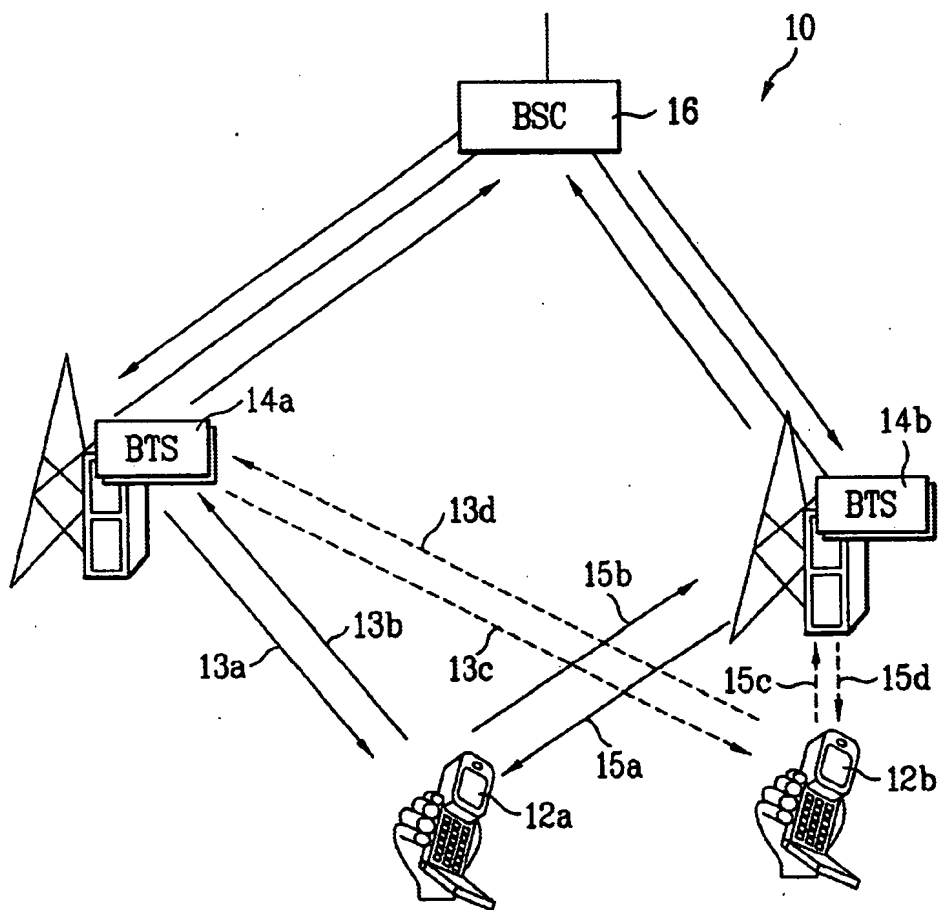


FIG. 2

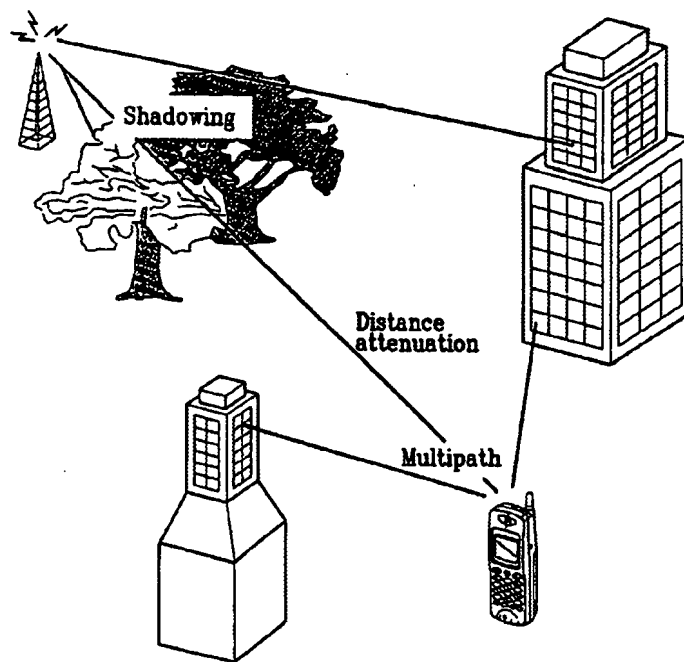


FIG. 3

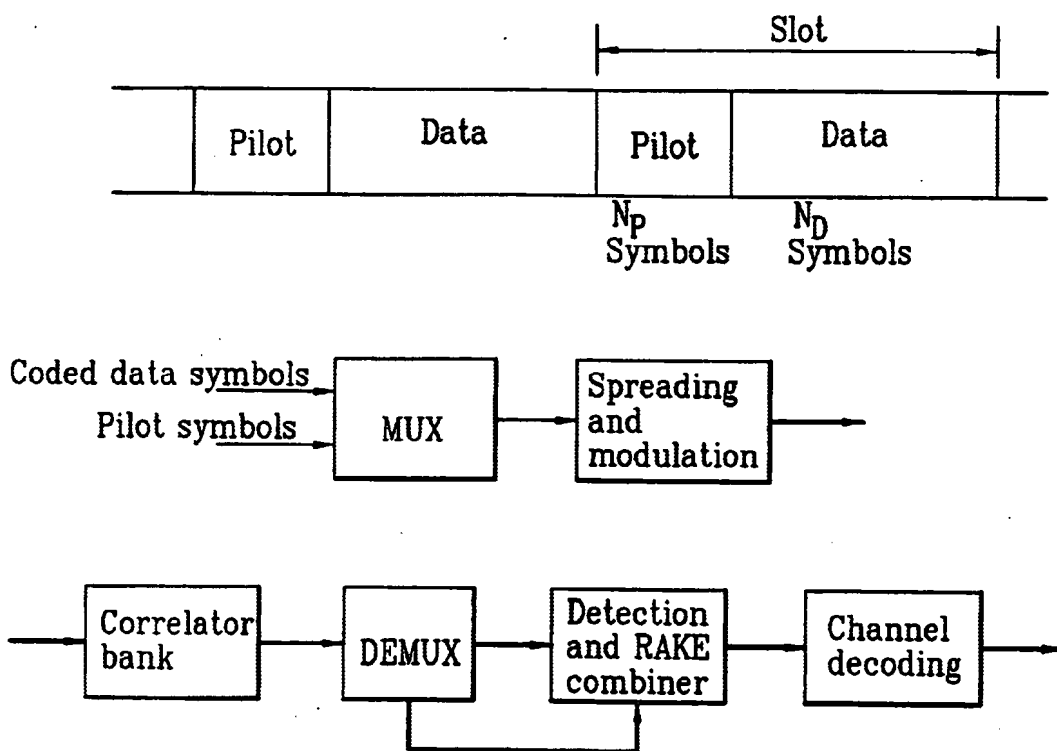


FIG. 4

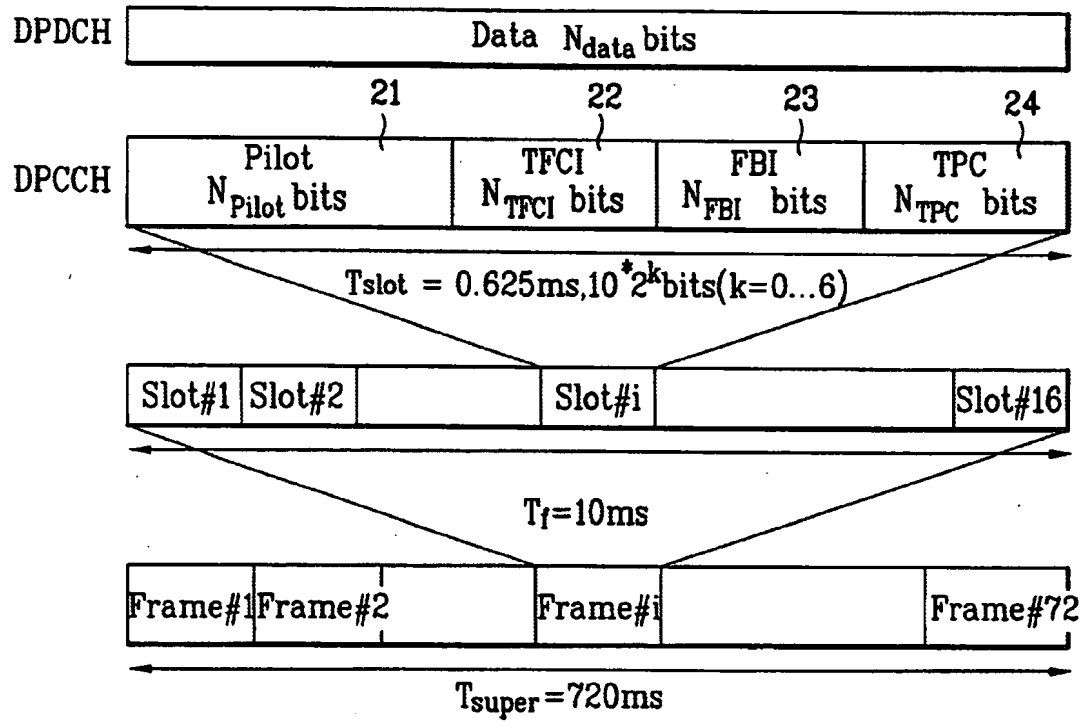


FIG. 5

Channel Bit Rate(kbps)	Channel Symbol Rate(ksps)	SF	Bits/Frame	Bits/Slot	N_{pilot}	N_{TPC}	N_{TFCI}	N_{FBI}
16	16	256	160	10	6	2	2	0
16	16	256	160	10	8	2	0	0
16	16	256	160	10	5	2	2	1
16	16	256	160	10	7	2	0	1
16	16	256	160	10	[6]	[2]	[0]	[2]
16	16	256	160	10	[5]	[1]	[2]	[2]

FIG. 6

	N _{pilot} =6						N _{pilot} =8							
Bit #	0	1	2	3	4	5	0	1	2	3	4	5	6	7
slot #1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	0	1	1	1	1	1	1	0	1	1
3	1	0	1	1	0	1	1	0	1	1	1	0	1	1
4	1	1	0	1	0	1	1	1	1	0	1	0	1	1
5	1	1	0	1	1	1	1	1	1	0	1	1	1	1
6	1	1	0	1	1	1	1	1	1	0	1	1	1	1
7	1	0	1	1	0	0	1	0	1	1	1	0	1	0
8	1	1	0	1	0	1	1	1	1	0	1	0	1	1
9	1	1	1	1	0	0	1	1	1	1	1	0	1	0
10	1	0	1	1	0	1	1	0	1	1	1	0	1	1
11	1	1	1	1	1	0	1	1	1	1	1	1	1	0
12	1	0	1	1	0	1	1	0	1	1	1	0	1	1
13	1	0	0	1	0	1	1	0	1	0	1	0	1	1
14	1	1	0	1	0	0	1	1	1	0	1	0	1	0
15	1	0	1	1	0	0	1	0	1	1	1	0	1	0
16	1	0	0	1	0	0	1	0	1	0	1	0	1	0

FIG. 7

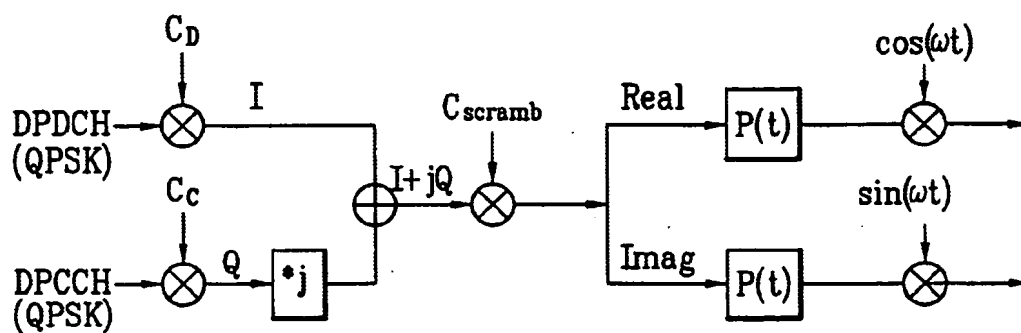


FIG. 8

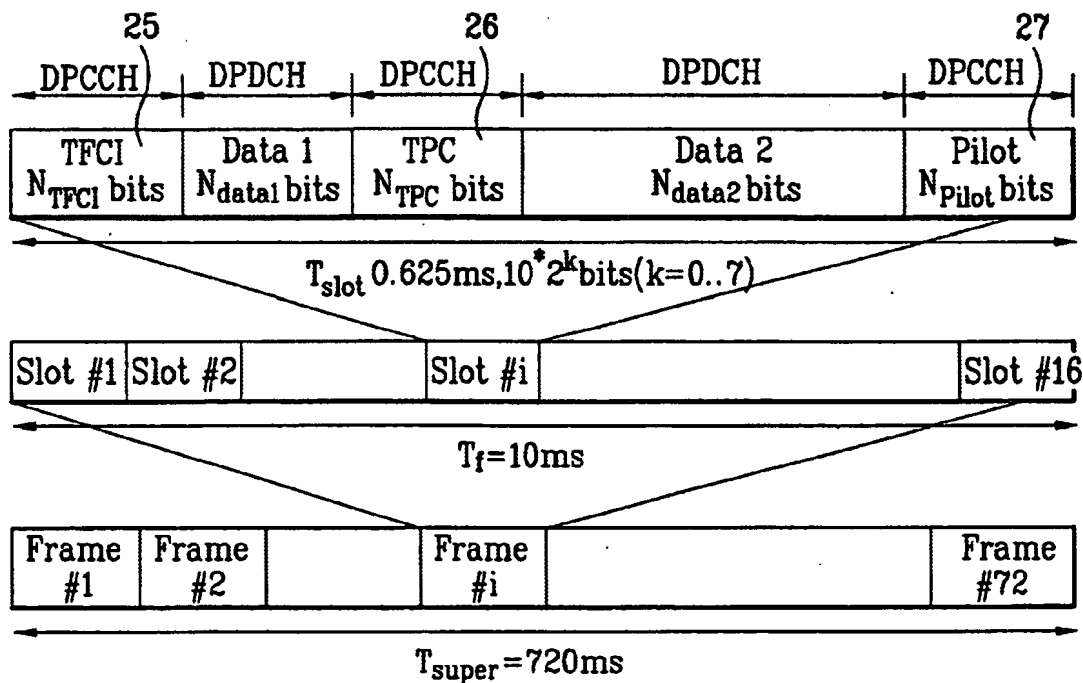
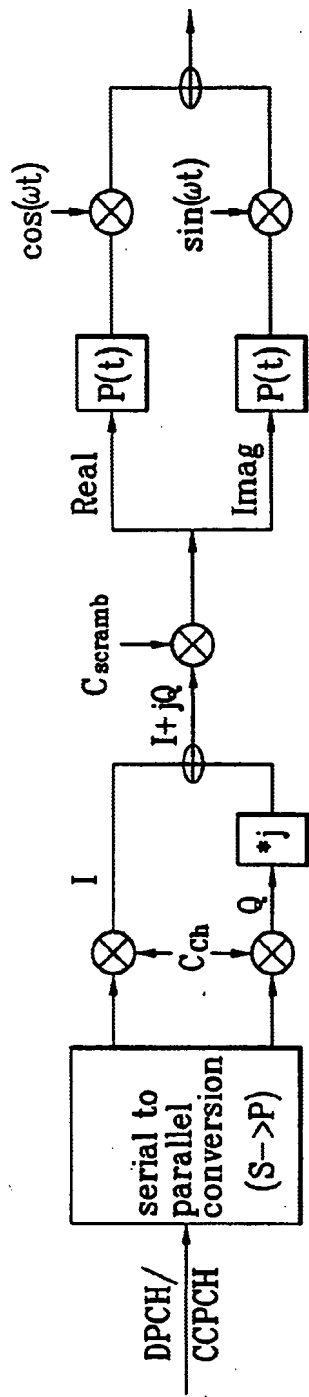


FIG. 9

Symblo rate	8ksps		16,32,64,128ksps				256,512,1024ksps							
Symblo #	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	11	11	11	11	11	11	11	11	11	11	11	11	10
2	11	11	11	11	11	01	11	10	11	10	11	10	11	01
3	11	10	11	01	11	01	11	10	11	01	11	11	11	01
4	11	01	11	10	11	01	11	11	11	01	11	00	11	10
5	11	10	11	10	11	11	11	11	11	00	11	01	11	10
6	11	10	11	10	11	11	11	11	11	11	11	01	11	10
7	11	01	11	01	11	00	11	10	11	11	11	01	11	10
8	11	00	11	10	11	01	11	01	11	00	11	10	11	00
9	11	00	11	11	11	00	11	11	11	10	11	00	11	01
10	11	10	11	01	11	01	11	01	11	11	11	11	11	00
11	11	10	11	11	11	10	11	10	11	10	11	11	11	10
12	11	11	11	01	11	01	11	01	11	10	11	10	11	00
13	11	10	11	00	11	01	11	10	11	01	11	11	11	10
14	11	11	11	10	11	00	11	00	11	10	11	10	11	00
15	11	00	11	01	11	00	11	01	11	10	11	00	11	00
16	11	00	11	00	11	00	11	10	11	00	11	00	11	00

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FIG. 10



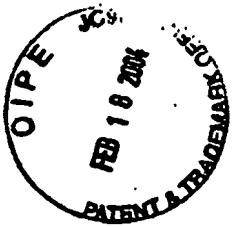


FIG. 11A

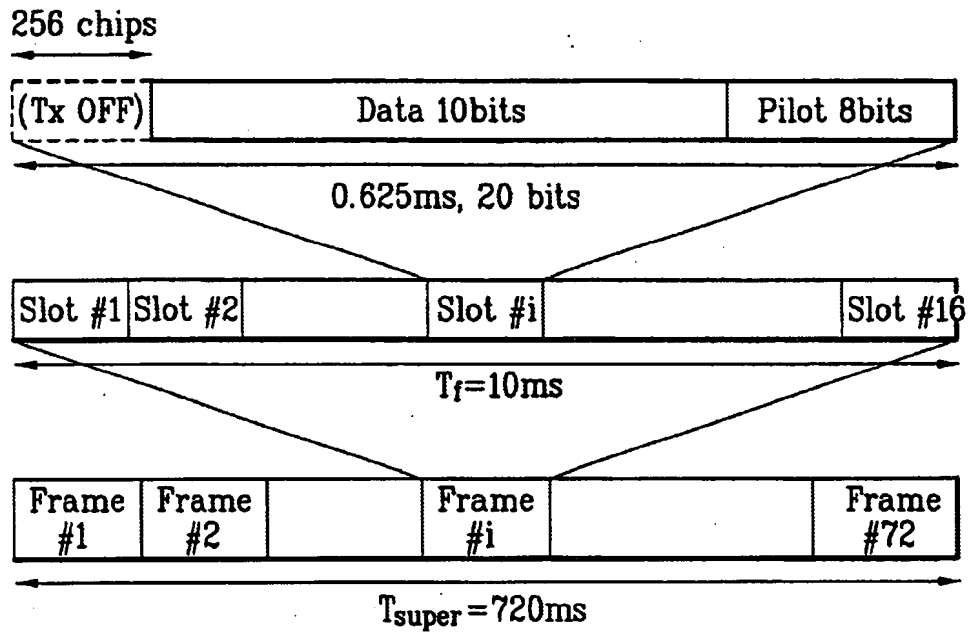
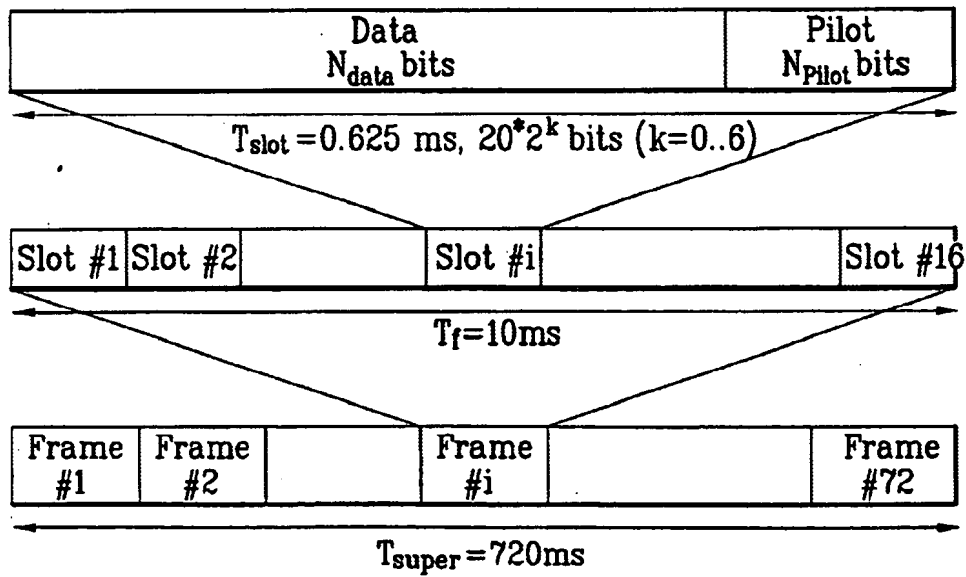


FIG. 11B



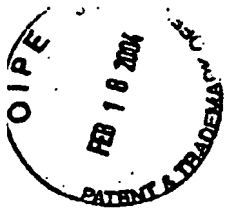


FIG. 13A

$R_E(\tau) + R_F(\tau)$, or $(R_G(\tau) + R_H(\tau))$

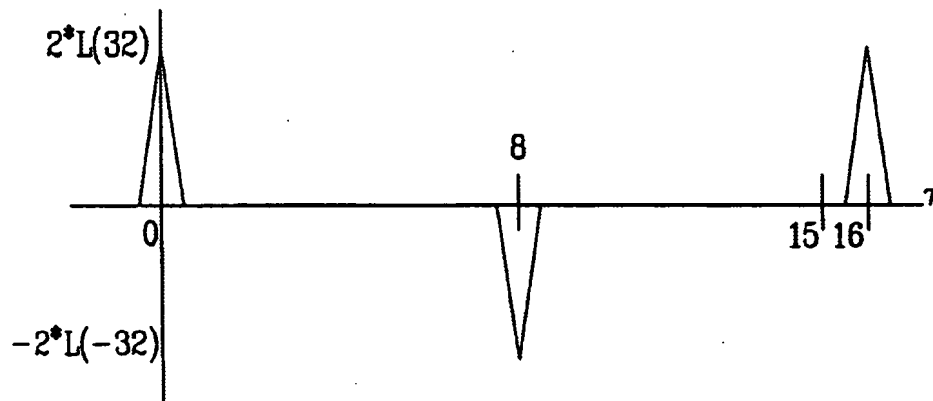


FIG. 13B

$R_E(\tau) + R_F(\tau)$, + $(R_G(\tau) + R_H(\tau))$

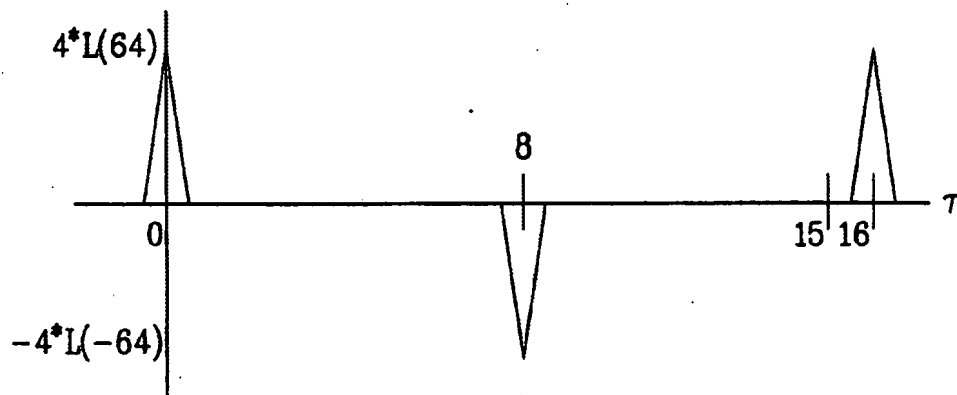




FIG. 14A

	N _{pilot} = 5					N _{pilot} = 6					
Bit #	0	1	2	3	4	0	1	2	3	4	5
Slot #1	1	1	1	1	0	1	1	1	1	1	0
2	1	0	1	1	1	1	1	0	1	1	1
3	0	0	1	0	1	1	0	0	1	0	1
4	1	0	1	1	1	1	1	0	1	1	1
5	1	1	1	1	0	1	1	1	1	1	0
6	1	0	1	1	1	1	1	0	1	1	1
7	1	1	1	0	1	1	1	1	1	0	1
8	1	0	1	0	0	1	1	0	1	0	0
9	0	0	1	0	1	1	0	0	1	0	1
10	0	1	1	0	0	1	0	1	1	0	0
11	1	1	1	1	0	1	1	1	1	1	0
12	0	1	1	0	0	1	0	1	1	0	0
13	0	0	1	0	1	1	0	0	1	0	1
14	0	1	1	0	0	1	0	1	1	0	0
15	0	0	1	1	0	1	0	0	1	1	0
16	0	1	1	1	1	1	0	1	1	1	1

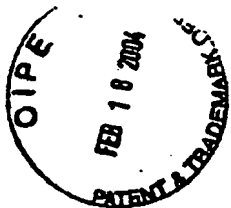


FIG. 14B

	N _{pilot} = 7							N _{pilot} = 8							
Bit #	0	1	2	3	4	5	6	0	1	2	3	4	5	6	7
Slot #1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0
2	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
3	1	0	0	1	0	1	1	1	0	1	0	1	0	1	1
4	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
5	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
6	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
7	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1
8	1	1	0	1	0	0	1	1	1	1	0	1	0	1	0
9	1	0	0	1	0	1	1	1	0	1	0	1	0	1	1
10	1	0	1	1	0	0	1	1	0	1	1	1	0	1	0
11	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
12	1	0	1	1	0	0	1	1	0	1	1	1	0	1	0
13	1	0	0	1	0	1	1	1	0	1	0	1	0	1	1
14	1	0	1	1	0	0	1	1	0	1	1	1	0	1	0
15	1	0	0	1	1	0	1	1	0	1	0	1	1	1	0
16	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1



FIG. 14C

N_{pilot}	Pilot bit position #	Corresponding word of length 16
5	0	C_1
	1	C_2
	3	C_3
	4	C_4
6	1	C_1
	2	C_2
	4	C_3
	5	C_4
7	1	C_1
	2	C_2
	4	C_3
	5	C_4
8	1	C_1
	3	C_2
	5	C_3
	7	C_4

FIG. 14D

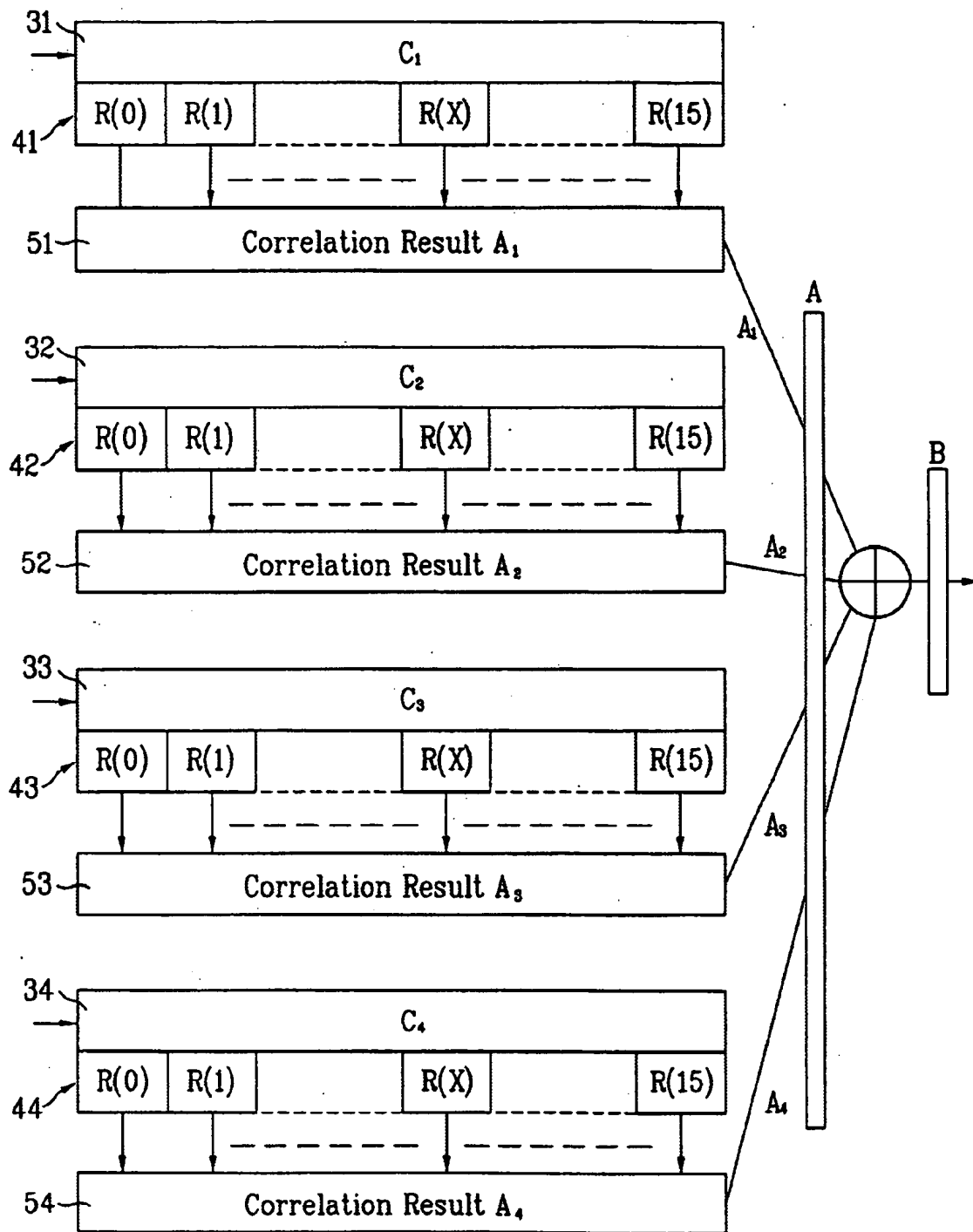


FIG. 14E

	R_x (0)	R_x (1)	R_x (2)	R_x (3)	R_x (4)	R_x (5)	R_x (6)	R_x (7)	R_x (8)	R_x (9)	R_x (10)	R_x (11)	R_x (12)	R_x (13)	R_x (14)	R_x (15)
A ₁ POINT	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
A ₂ POINT	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
A ₃ POINT	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
A ₄ POINT	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
B POINT	64	0	0	0	0	0	0	0	-64	0	0	0	0	0	0	0

FIG. 14F

	R_x (0)	R_x (1)	R_x (2)	R_x (3)	R_x (4)	R_x (5)	R_x (6)	R_x (7)	R_x (8)	R_x (9)	R_x (10)	R_x (11)	R_x (12)	R_x (13)	R_x (14)	R_x (15)
A ₁ POINT +A ₂ POINT	32	0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0
A ₃ POINT +A ₄ POINT	32	0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0
A ₁ POINT +A ₄ POINT	32	0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0
A ₂ POINT +A ₃ POINT	32	0	0	0	0	0	0	0	-32	0	0	0	0	0	0	0

FIG. 14G

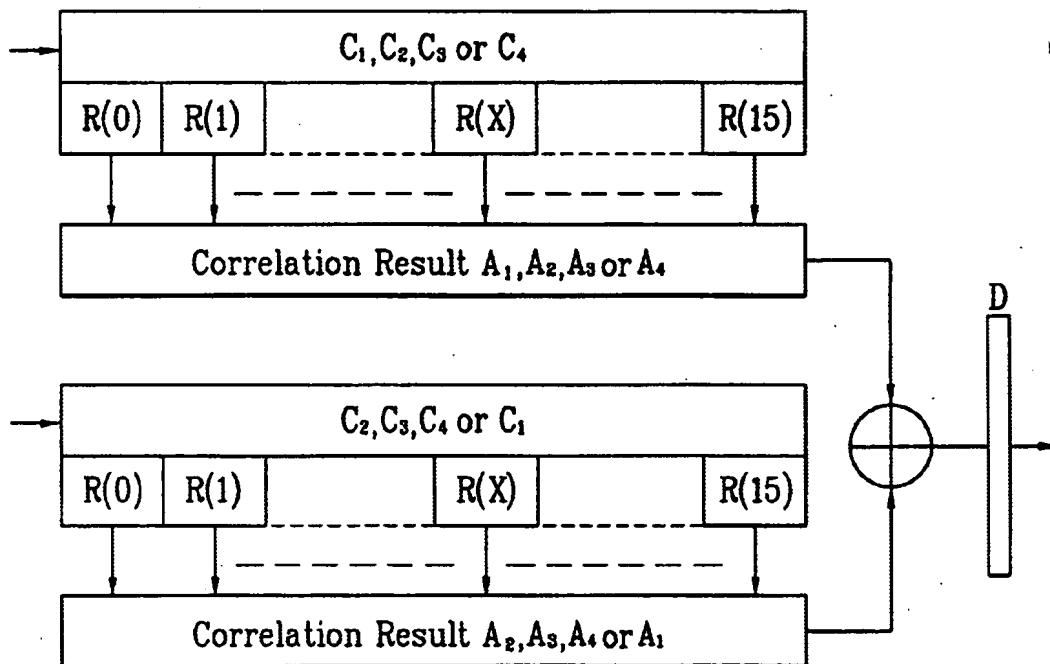


FIG. 14H

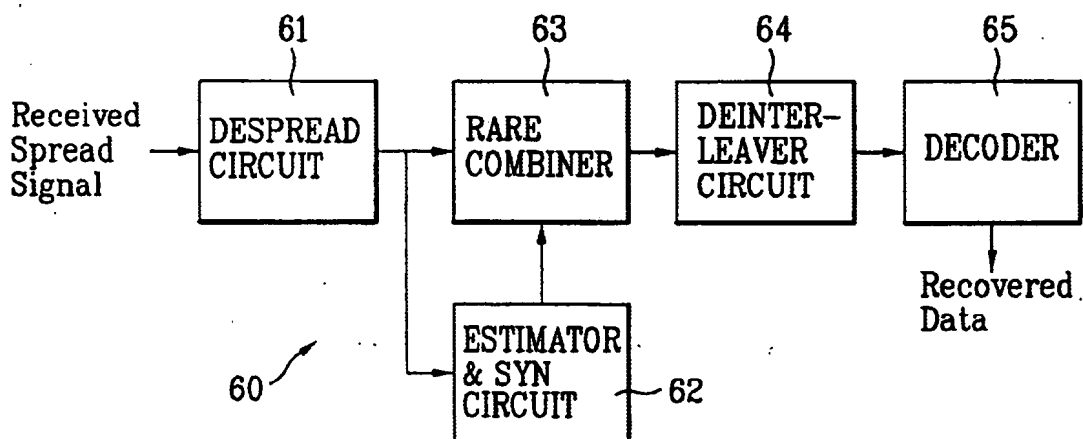




FIG. 14I

	R_x (0)	R_x (1)	R_x (2)	R_x (3)	R_x (4)	R_x (5)	R_x (6)	R_x (7)	R_x (8)	R_x (9)	R_x (10)	R_x (11)	R_x (12)	R_x (13)	R_x (14)	R_x (15)
A ₁ POINT	16	-4	-4	8	0	-4	0	0	-4	0	0	-4	0	8	-4	-4
A ₂ POINT	16	0	0	-4	-4	-4	0	0	12	0	0	-4	-4	-4	0	0
A ₃ POINT	16	4	0	0	4	8	8	0	0	0	8	8	4	0	0	4
A ₄ POINT	16	0	4	-4	0	0	-4	4	0	4	-4	0	0	-4	4	0
B POINT	64	0	0	0	0	0	4	4	8	4	4	0	0	0	0	0

FIG. 14J

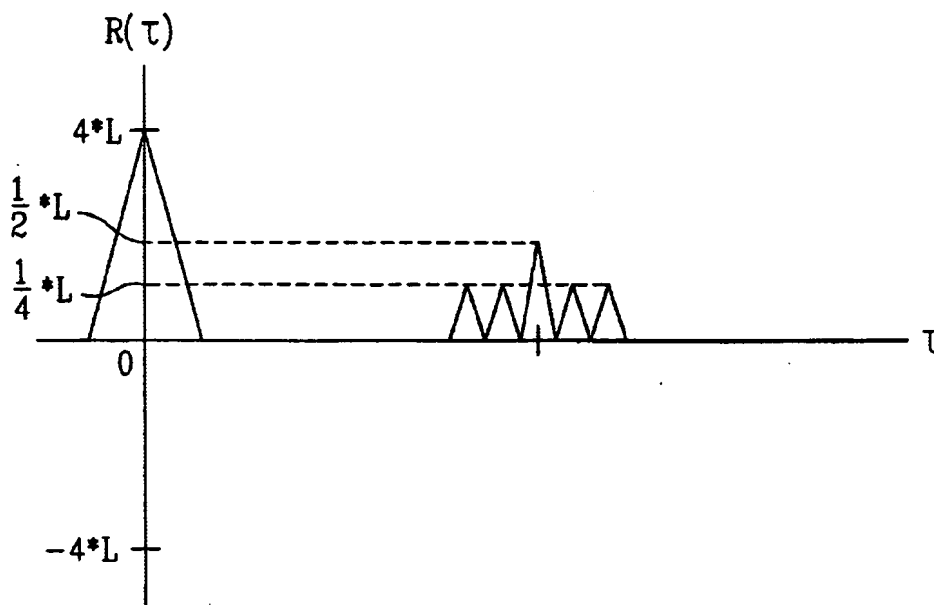


FIG. 15A

	$N_{\text{pilot}} = 4$		$N_{\text{pilot}} = 8$				$N_{\text{pilot}} = 16$							
Symbol #	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	11	11	11	11	10	11	11	11	10	11	11	11	01
2	11	10	11	10	11	11	11	10	11	11	11	01	11	11
3	11	00	11	00	11	01	11	00	11	01	11	11	11	01
4	11	10	11	10	11	11	11	10	11	11	11	10	11	00
5	11	11	11	11	11	10	11	11	11	10	11	00	11	01
6	11	10	11	10	11	11	11	10	11	11	11	01	11	00
7	11	11	11	11	11	01	11	11	11	01	11	00	11	10
8	11	10	11	10	11	00	11	10	11	00	11	01	11	11
9	11	00	11	00	11	01	11	00	11	01	11	00	11	10
10	11	01	11	01	11	00	11	01	11	00	11	10	11	00
11	11	11	11	11	11	10	11	11	11	10	11	00	11	10
12	11	01	11	01	11	00	11	01	11	00	11	01	11	11
13	11	00	11	00	11	01	11	00	11	01	11	11	11	10
14	11	01	11	01	11	00	11	01	11	00	11	10	11	11
15	11	00	11	00	11	10	11	00	11	10	11	11	11	01
16	11	01	11	01	11	11	11	01	11	11	11	10	11	00

FIG. 15B

Symbol rate	Symbol #	Channel	Corresponding word of length $L=16$
$N_{\text{pilot}} = 4$	1	I-CH	C_1
		Q-CH	C_2
$N_{\text{pilot}} = 8$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
$N_{\text{pilot}} = 16$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
	5	I-CH	C_5
		Q-CH	C_6
	7	I-CH	C_7
		Q-CH	C_8



FIG. 15C

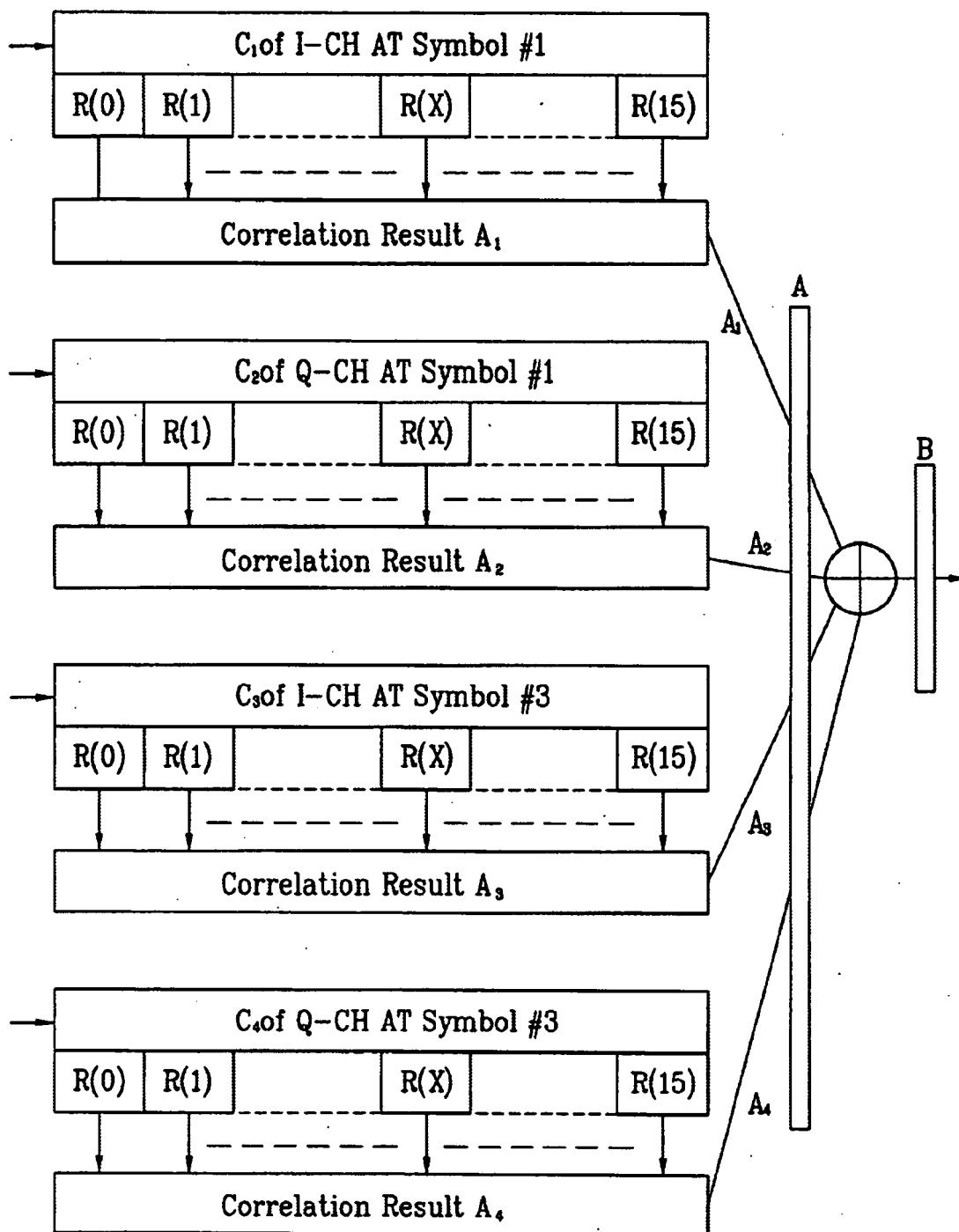




FIG. 16A

Symblo #	0	1	2	3
Slot #1	11	11	11	10
2	11	10	11	11
3	11	00	11	01
4	11	10	11	11
5	11	11	11	10
6	11	10	11	11
7	11	11	11	01
8	11	10	11	00
9	11	00	11	01
10	11	01	11	00
11	11	11	11	10
12	11	01	11	00
13	11	00	11	01
14	11	01	11	00
15	11	00	11	10
16	11	01	11	11

FIG. 16B

Symbol #	Channel	Corresponding word of length 16
1	I-CH	C ₁
	Q-CH	C ₂
3	I-CH	C ₃
	Q-CH	C ₄

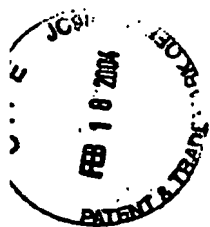


FIG. 16C

Symblo rate	$N_{\text{pilot}} = 8$				$N_{\text{pilot}} = 1$							
Symblo #	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	11	11	10	11	11	11	10	11	11	11	01
2	11	10	11	11	11	10	11	11	11	01	11	11
3	11	00	11	01	11	00	11	01	11	11	11	01
4	11	10	11	11	11	10	11	11	11	10	11	00
5	11	11	11	10	11	11	11	10	11	00	11	01
6	11	10	11	11	11	10	11	11	11	01	11	00
7	11	11	11	01	11	11	11	01	11	00	11	10
8	11	10	11	00	11	10	11	00	11	01	11	11
9	11	00	11	01	11	00	11	01	11	00	11	10
10	11	01	11	00	11	01	11	00	11	10	11	00
11	11	11	11	10	11	11	11	10	11	00	11	10
12	11	01	11	00	11	01	11	00	11	01	11	11
13	11	00	11	01	11	00	11	01	11	11	11	10
14	11	01	11	00	11	01	11	00	11	10	11	11
15	11	00	11	10	11	00	11	10	11	11	11	01
16	11	01	11	11	11	01	11	11	11	10	11	00

FIG. 16D

Symbol rate	Symbol #	Channel	Corresponding word of length $L=16$
$N_{\text{pilot}} = 8$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
$N_{\text{pilot}} = 16$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
	5	I-CH	C_5
		Q-CH	C_6
	7	I-CH	C_7
		Q-CH	C_8

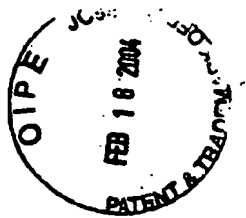


FIG. 17A

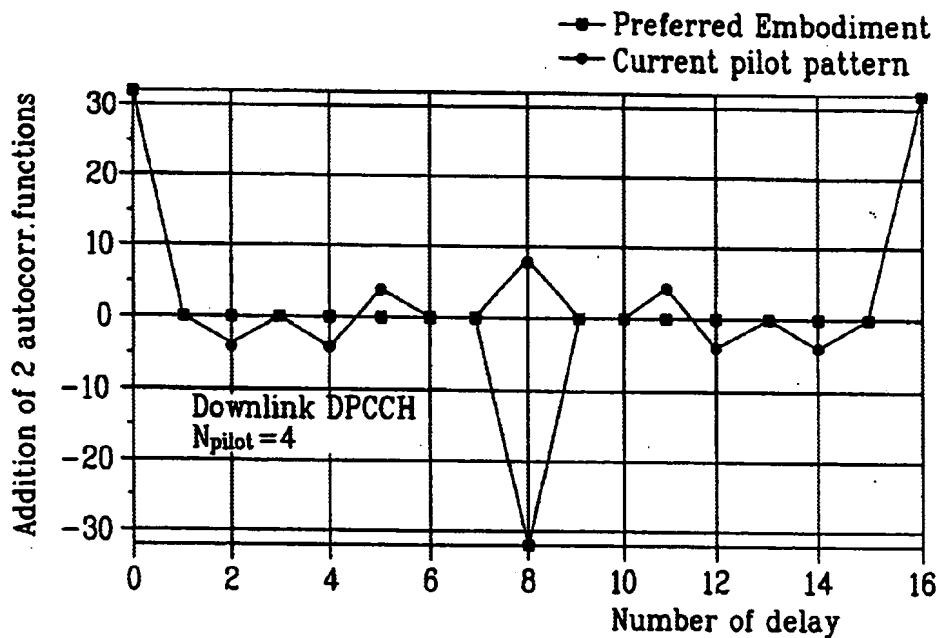


FIG. 17B

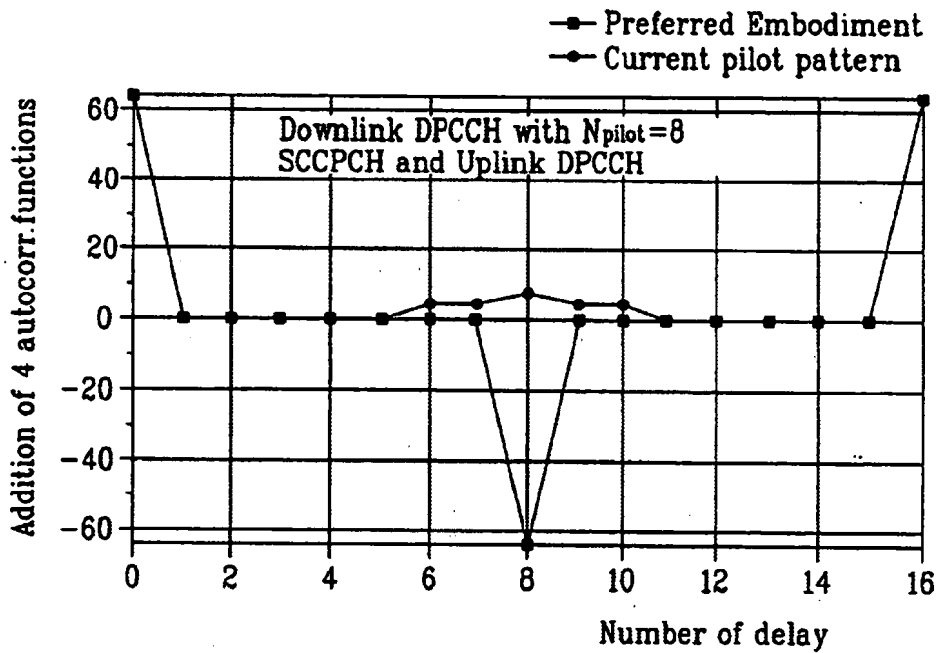


FIG. 17C

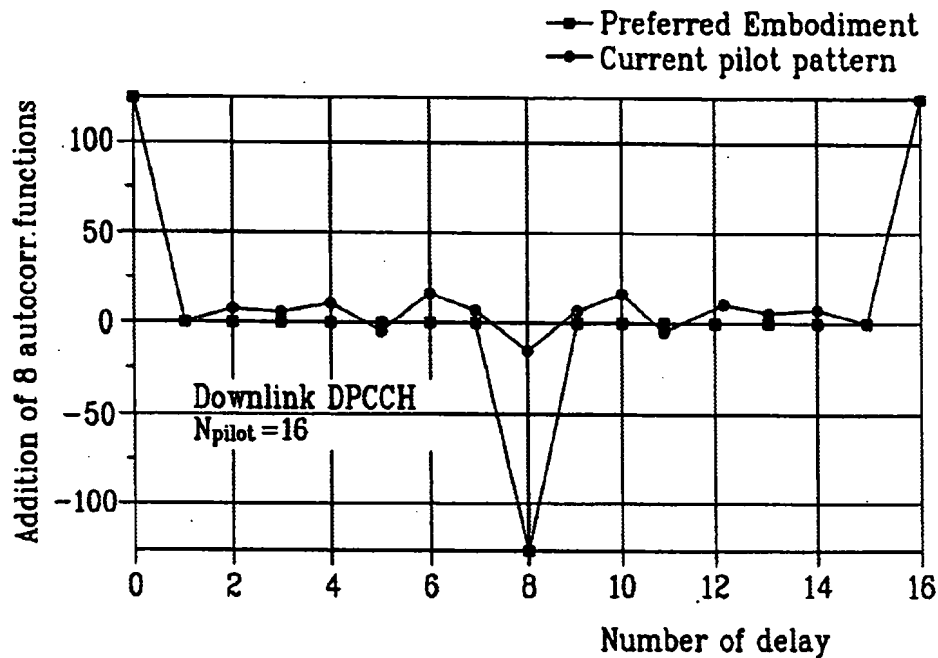


FIG. 18A

Parameters	Downlink
Slot per frame	16
Number of bits in the DPCCH (Pilot/TPC/TFI)	4/2/0
Number of bits in the DPDCH per each slot	4
Spreading factor (DPDCH)	512
Spreading factor (DPCCH)	512
Modulation	QPSK
3dB bandwidth	4.096MHz
Shaping filter	Root raised cosine (roll off 0.22)
Power amplifier	Ideal
Propagation channel	AWGN

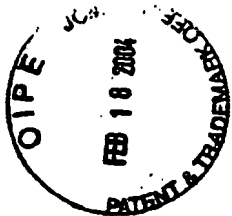


FIG. 18B

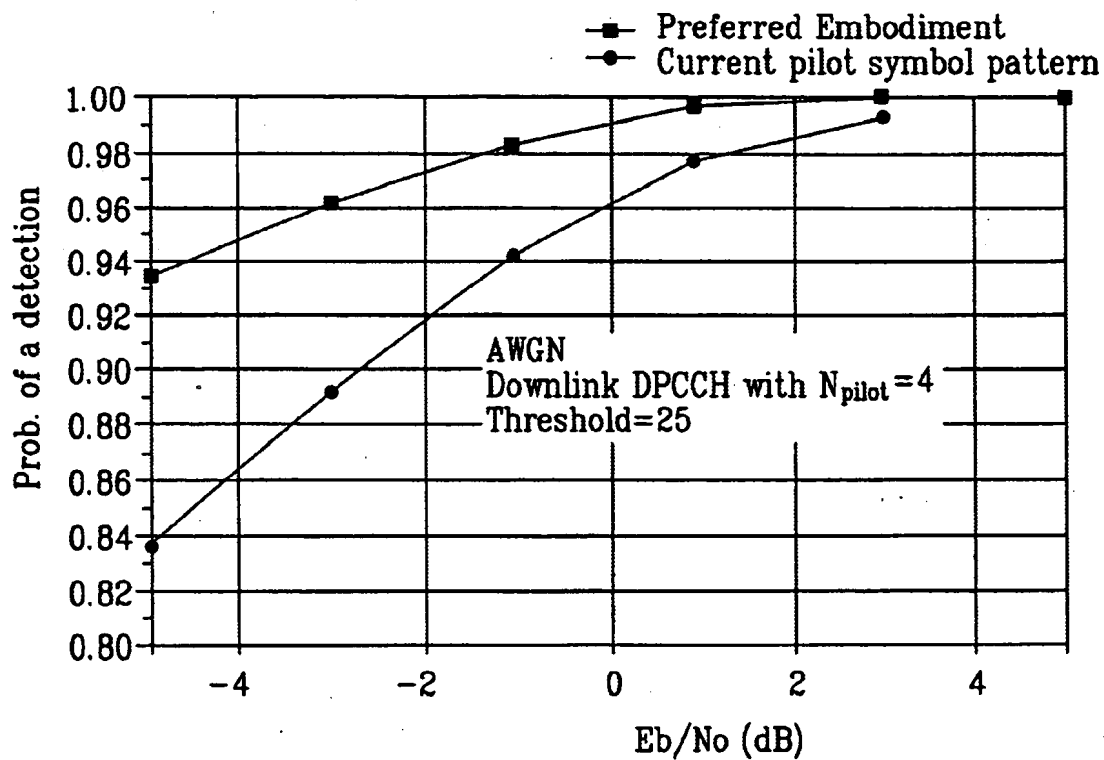


FIG. 18C

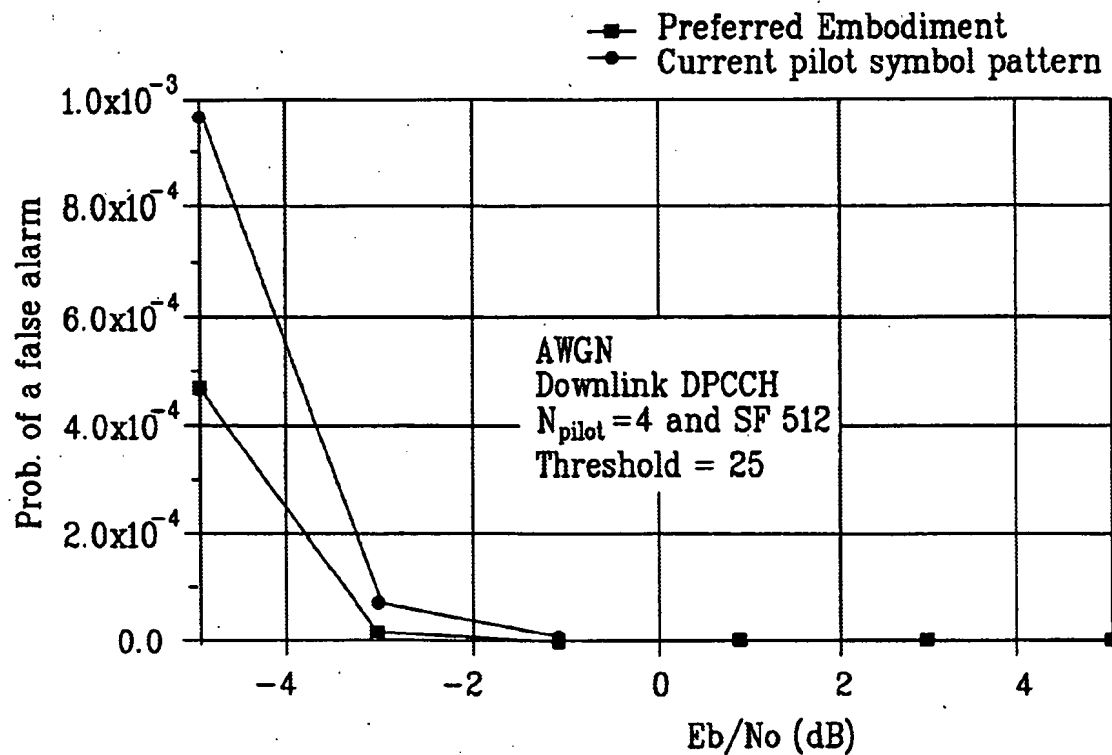




FIG. 18D

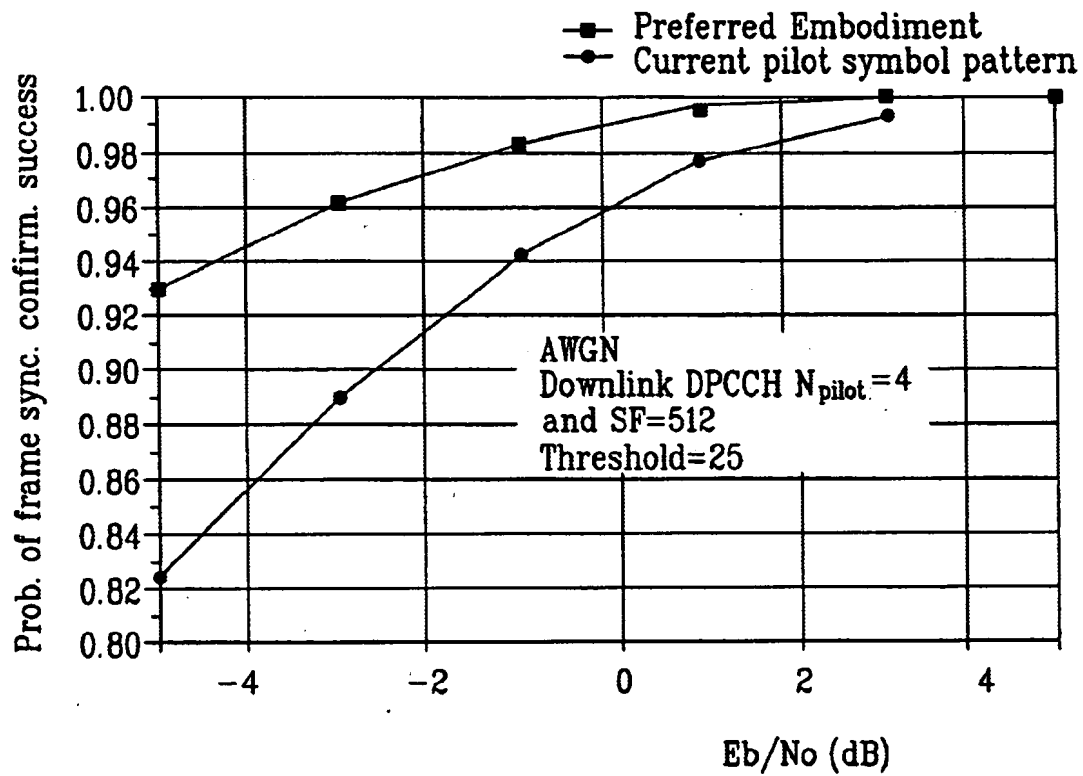


FIG. 19A

	$N_{pilot} = 4$		$N_{pilot} = 8$				$N_{pilot} = 16$							
Symbol #	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	01	10	11	00	00	10	11	00	00	10	11	11	00	10
2	00	10	11	01	00	11	11	01	00	11	11	01	00	00
3	10	10	11	11	00	01	11	11	00	01	11	11	00	10
4	00	10	11	01	00	11	11	01	00	11	11	10	00	11
5	01	10	11	00	00	10	11	00	00	10	11	11	00	01
6	00	10	11	01	00	11	11	01	00	11	11	10	00	00
7	01	10	11	11	00	10	11	11	00	10	11	00	00	01
8	00	10	11	10	00	11	11	10	00	11	11	01	00	00
9	10	10	11	11	00	01	11	11	00	01	11	00	00	01
10	11	10	11	10	00	00	11	10	00	00	11	10	00	11
11	01	10	11	00	00	10	11	00	00	10	11	00	00	01
12	11	10	11	10	00	00	11	10	00	00	11	01	00	00
13	10	10	11	11	00	01	11	11	00	01	11	00	00	10
14	11	10	11	10	00	00	11	10	00	00	11	01	00	11
15	10	10	11	00	00	01	11	00	00	01	11	11	00	10
16	11	10	11	01	00	00	11	01	00	00	11	10	00	11

FIG. 19B

Symbol rate	Symbol #	Channel	Corresponding word of length 16
$N_{pilot} = 4$	0	I - CH	$-C_1$
		Q - CH	C_2
$N_{pilot} = 8$	1	I - CH	$-C_3$
		Q - CH	C_4
	3	I - CH	C_1
		Q - CH	$-C_2$
$N_{pilot} = 16$	1	I - CH	$-C_3$
		Q - CH	C_4
	3	I - CH	C_1
		Q - CH	$-C_2$
	5	I - CH	$-C_7$
		Q - CH	C_6
	7	I - CH	C_5
		Q - CH	$-C_8$

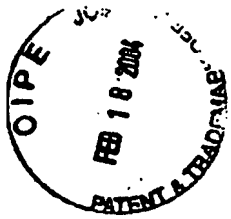


FIG. 19C

Symbol #	0	1	2	3
Slot #1	11	11	00	01
2	11	10	00	00
3	11	00	00	10
4	11	10	00	00
5	11	11	00	01
6	11	10	00	00
7	11	11	00	10
8	11	10	00	11
9	11	00	00	10
10	11	01	00	11
11	11	11	00	01
12	11	01	00	11
13	11	00	00	10
14	11	01	00	11
15	11	00	00	01
16	11	01	00	00

FIG. 19D

Symbol rate	Channel	Corresponding word of length 16
1	I - CH	C ₁
	Q - CH	C ₂
3	I - CH	-C ₃
	Q - CH	-C ₄

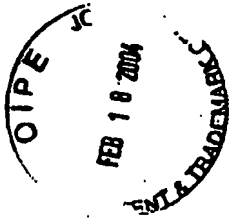


FIG. 19E

Symbol #	N _{pilot} = 8				N _{pilot} = 16							
	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	00	00	10	11	00	00	10	11	11	00	10
2	11	01	00	11	11	01	00	11	11	01	00	00
3	11	11	00	01	11	11	00	01	11	11	00	10
4	11	01	00	11	11	01	00	11	11	10	00	11
5	11	00	00	10	11	00	00	10	11	11	00	01
6	11	01	00	11	11	01	00	11	11	10	00	00
7	11	11	00	10	11	11	00	10	11	00	00	01
8	11	10	00	11	11	10	00	11	11	01	00	00
9	11	11	00	01	11	11	00	01	11	00	00	01
10	11	10	00	00	11	10	00	00	11	10	00	11
11	11	00	00	10	11	00	00	10	11	00	00	01
12	11	10	00	00	11	10	00	00	11	01	00	00
13	11	11	00	01	11	11	00	01	11	00	00	10
14	11	10	00	00	11	10	00	00	11	01	00	11
15	11	00	00	01	11	00	00	01	11	11	00	10
16	11	01	00	00	11	01	00	00	11	10	00	11

FIG. 19F

Symbol rate	Symbol #	Channel	Corresponding word of length 16
N _{pilot} = 8	1	I - CH	-C ₃
		Q - CH	C ₄
	3	I - CH	C ₁
		Q - CH	-C ₂
N _{pilot} = 16	1	I - CH	-C ₃
		Q - CH	C ₄
	3	I - CH	C ₁
		Q - CH	-C ₂
	5	I - CH	-C ₇
		Q - CH	C ₆
	7	I - CH	C ₅
		Q - CH	-C ₈

FIG. 20A

Sequence	Autocorrelation
$C_1 = (1101111100100000)$	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_2 = (1000101001110101)$	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_3 = (1111101100000100)$	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_4 = (0101000110101110)$	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_5 = (0011101111000100)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
$C_6 = (0010010111011010)$	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4
$C_7 = (0111000010001111)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
$C_8 = (1011101001000101)$	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4
$C_9 = (0011011111001000)$	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_{10} = (0010100111010110)$	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_{11} = (1100000100111110)$	16 4 0 4 0 -4 0 -4 -16 -4 0 -4 0 4 0 4
$C_{12} = (1011100101000110)$	16 -4 0 -4 0 4 0 4 -16 4 0 4 0 -4 0 -4
$C_{13} = (0100001110111100)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
$C_{14} = (1000100101110110)$	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4
$C_{15} = (0000100011110111)$	16 4 0 -4 0 4 0 -4 -16 -4 0 4 0 -4 0 4
$C_{16} = (1001000101101110)$	16 -4 0 4 0 -4 0 4 -16 4 0 -4 0 4 0 -4

FIG. 20B

$R(\tau)$ τ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
$R_E(\tau)$	16	4	0	4	0	-4	0	-4	-16	-4	0	-4	0	4	0	4
$R_F(\tau)$	16	-4	0	-4	0	4	0	4	-16	4	0	4	0	-4	0	-4
$R_G(\tau)$	16	4	0	-4	0	4	0	-4	-16	-4	0	4	0	-4	0	4
$R_H(\tau)$	16	-4	0	4	0	-4	0	4	-16	4	0	-4	0	4	0	-4

FIG. 20C

Bit #	N _{pilot} = 6						N _{pilot} = 8							
	0	1	2	3	4	5	0	1	2	3	4	5	6	7
Slot #1	1	1	1	1	1	0	1	1	1	1	1	1	1	0
2	1	1	0	1	1	1	1	1	1	0	1	1	1	1
3	1	0	0	1	1	0	1	0	1	0	1	1	1	0
4	1	1	0	1	1	1	1	1	1	0	1	1	1	1
5	1	1	1	1	1	0	1	1	1	1	1	1	1	0
6	1	1	0	1	0	0	1	1	1	0	1	0	1	0
7	1	1	1	1	1	0	1	1	1	1	1	1	1	0
8	1	1	0	1	1	1	1	1	1	0	1	1	1	1
9	1	0	0	1	0	1	1	0	1	0	1	0	1	1
10	1	0	1	1	0	0	1	0	1	1	1	0	1	0
11	1	1	1	1	0	1	1	1	1	1	1	0	1	1
12	1	0	1	1	0	0	1	0	1	1	1	0	1	0
13	1	0	0	1	0	1	1	0	1	0	1	0	1	1
14	1	0	1	1	1	1	1	0	1	1	1	1	1	1
15	1	0	0	1	0	1	1	0	1	0	1	0	1	1
16	1	0	1	1	0	0	1	0	1	1	1	0	1	0

FIG. 20D

N _{pilot}	Pilot bit position #	Corresponding word of length 16
6	1	C ₁
	2	C ₂
	4	C ₃
	5	C ₄
8	1	C ₁
	3	C ₂
	5	C ₃
	7	C ₄



FIG. 20E

Symbol rate	8kps		16,32,64,128kps				256,512,1024kps							
Symbol #	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	11	11	11	11	10	11	11	11	10	11	00	11	01
2	11	10	11	10	11	11	11	10	11	11	11	00	11	10
3	11	00	11	00	11	10	11	00	11	10	11	11	11	11
4	11	10	11	10	11	11	11	10	11	11	11	10	11	11
5	11	11	11	11	11	10	11	11	11	10	11	10	11	01
6	11	10	11	10	11	00	11	10	11	00	11	01	11	00
7	11	11	11	11	11	10	11	11	11	10	11	10	11	01
8	11	10	11	10	11	11	11	10	11	11	11	11	11	00
9	11	00	11	00	11	01	11	00	11	01	11	11	11	10
10	11	01	11	01	11	00	11	01	11	00	11	11	11	01
11	11	11	11	11	11	01	11	11	11	01	11	00	11	00
12	11	01	11	01	11	00	11	01	11	00	11	01	11	00
13	11	00	11	00	11	01	11	00	11	01	11	01	11	10
14	11	01	11	01	11	11	11	01	11	11	11	10	11	11
15	11	00	11	00	11	01	11	00	11	01	11	01	11	10
16	11	01	11	01	11	00	11	01	11	00	11	00	11	11



FIG. 20F

Symbol rate	2048,4096kps															
Symbol #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Slot #1	11	11	11	10	11	00	11	01	11	00	11	11	11	01	11	01
2	11	10	11	11	11	00	11	10	11	00	11	10	11	10	11	00
3	11	00	11	10	11	11	11	11	11	11	11	01	11	00	11	00
4	11	10	11	11	11	10	11	11	11	10	11	01	11	00	11	01
5	11	11	11	10	11	10	11	01	11	01	11	01	11	01	11	10
6	11	10	11	00	11	01	11	00	11	10	11	00	11	00	11	00
7	11	11	11	10	11	10	11	01	11	10	11	00	11	10	11	00
8	11	10	11	11	11	11	11	00	11	11	11	11	11	11	11	01
9	11	00	11	01	11	11	11	10	11	11	11	00	11	10	11	10
10	11	01	11	00	11	11	11	01	11	11	11	01	11	01	11	11
11	11	11	11	01	11	00	11	00	11	00	11	10	11	11	11	11
12	11	01	11	00	11	01	11	00	11	01	11	10	11	11	11	10
13	11	00	11	01	11	01	11	10	11	10	11	10	11	10	11	01
14	11	01	11	11	11	10	11	11	11	01	11	11	11	11	11	11
15	11	00	11	01	11	01	11	10	11	01	11	11	11	01	11	11
16	11	01	11	00	11	00	11	11	11	00	11	00	11	00	11	10

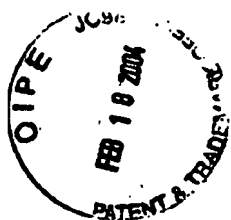


FIG. 20G

Symbol rate	Symbol #	Channel	Corresponding word of length 16
8ksps	1	I - CH	C ₁
		Q - CH	C ₂
16, 32, 64, 128ksps	1	I - CH	C ₁
		Q - CH	C ₂
	3	I - CH	C ₃
		Q - CH	C ₄
256, 512, 1024ksps	1	I - CH	C ₁
		Q - CH	C ₂
	3	I - CH	C ₃
		Q - CH	C ₄
	5	I - CH	C ₅
		Q - CH	C ₆
	7	I - CH	C ₇
		Q - CH	C ₈
2048, 4096ksps	1	I - CH	C ₁
		Q - CH	C ₂
	3	I - CH	C ₃
		Q - CH	C ₄
	5	I - CH	C ₅
		Q - CH	C ₆
	7	I - CH	C ₇
		Q - CH	C ₈
	9	I - CH	C ₉
		Q - CH	C ₁₀
	11	I - CH	C ₁₁
		Q - CH	C ₁₂
	13	I - CH	C ₁₃
		Q - CH	C ₁₄
	15	I - CH	C ₁₅
		Q - CH	C ₁₆

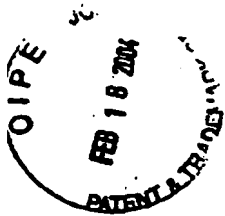


FIG. 20H

Symbol #	0	1	2	3
Slot #1	11	11	11	10
2	11	10	11	11
3	11	00	11	10
4	11	10	11	11
5	11	11	11	10
6	11	10	11	00
7	11	11	11	10
8	11	10	11	11
9	11	00	11	01
10	11	01	11	00
11	11	11	11	01
12	11	01	11	00
13	11	00	11	01
14	11	01	11	11
15	11	00	11	01
16	11	01	11	00

FIG. 20I

Symbol #	Channel	Corresponding word of length 16
1	I-CH	C ₁
	Q-CH	C ₂
3	I-CH	C ₃
	Q-CH	C ₄

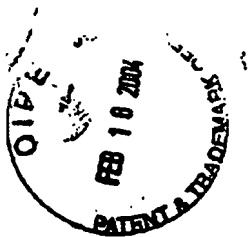


FIG. 21

Frame Synchronization Words															
L=15 , Slot No.	1	2	3	4	15									
$C_1 = (1\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 0\ 1\ 0\ 1\ 1\ 0\ 0)$															
$C_2 = (1\ 0\ 1\ 0\ 0\ 1\ 1\ 0\ 1\ 1\ 1\ 0\ 0\ 0\ 0)$															
$C_3 = (1\ 1\ 0\ 0\ 0\ 1\ 0\ 0\ 1\ 1\ 0\ 1\ 0\ 1\ 1)$															
$C_4 = (0\ 0\ 1\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 0\ 1\ 1)$															
$C_5 = (1\ 1\ 1\ 0\ 1\ 0\ 1\ 1\ 0\ 0\ 1\ 0\ 0\ 0\ 1)$															
$C_6 = (1\ 1\ 0\ 1\ 1\ 1\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 0\ 0)$															
$C_7 = (1\ 0\ 0\ 1\ 1\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 0\ 0\ 0)$															
$C_8 = (0\ 0\ 0\ 0\ 1\ 1\ 1\ 0\ 1\ 1\ 0\ 0\ 1\ 0\ 1)$															

FIG. 22A

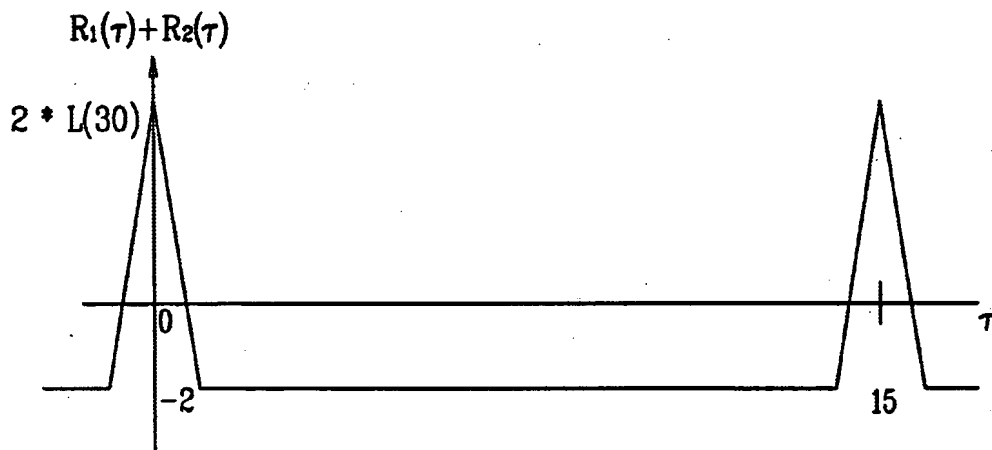
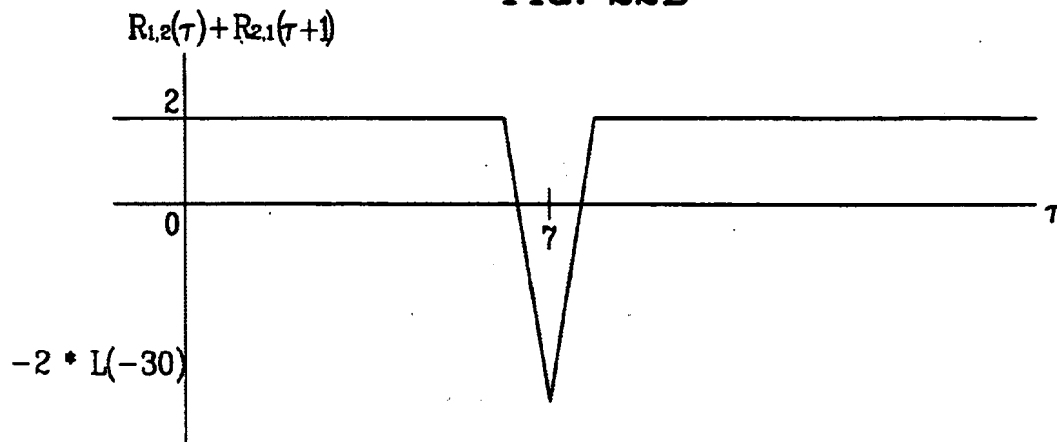


FIG. 22B



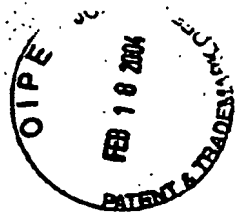


FIG. 22C

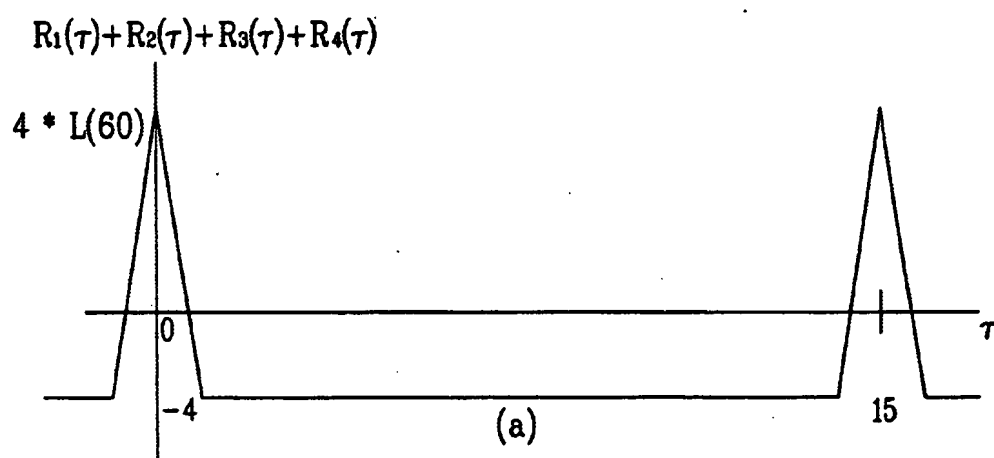


FIG. 22D

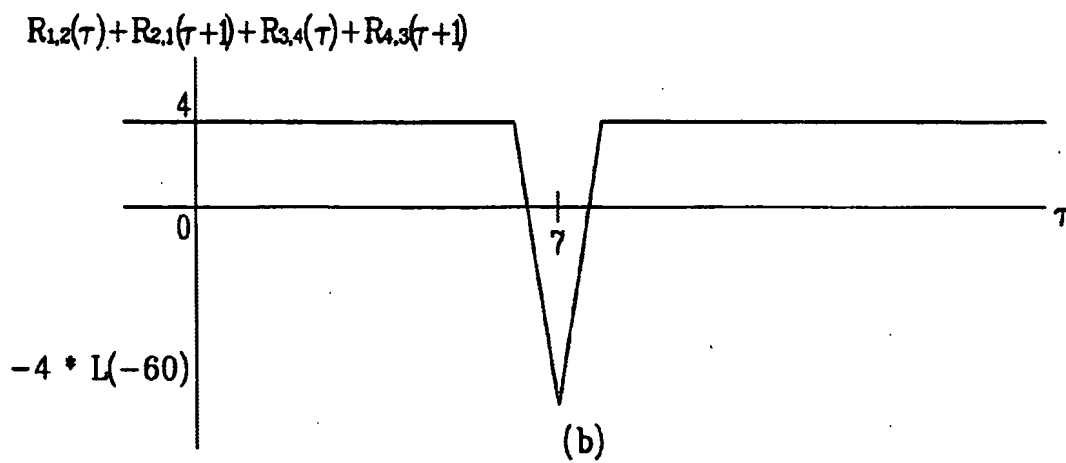


FIG. 23A

	$N_{pilot} = 2$		$N_{pilot} = 3$			$N_{pilot} = 4$			
Bit #	0	1	0	1	2	0	1	2	3
Slot #1	1	1	1	1	1	1	1	1	1
2	0	0	0	1	0	1	0	1	0
3	0	1	0	1	1	1	0	1	1
4	0	0	0	1	0	1	0	1	0
5	1	0	1	1	0	1	1	1	0
6	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1
8	1	0	1	1	0	1	1	1	0
9	0	1	0	1	1	1	0	1	1
10	1	1	1	1	1	1	1	1	1
11	0	1	0	1	1	1	0	1	1
12	1	0	1	1	0	1	1	1	0
13	1	0	1	1	0	1	1	1	0
14	0	0	0	1	0	1	0	1	0
15	0	0	0	1	0	1	0	1	0

FIG. 23B

N_{pilot}	Pilot bit position #	Corresponding word of length 15
2	0	C_1
	1	C_2
3	0	C_1
	2	C_2
4	1	C_1
	3	C_2



FIG. 23C

	N _{pilot} = 2		N _{pilot} = 3			N _{pilot} = 4			
Bit #	0	1	0	1	2	0	1	2	3
Slot #1	1	1	1	1	1	1	1	1	1
2	1	0	0	1	0	1	0	1	0
3	1	1	0	1	1	1	0	1	1
4	1	0	0	1	0	1	0	1	0
5	1	0	1	1	0	1	1	1	0
6	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1
8	1	0	1	1	0	1	1	1	0
9	1	1	0	1	1	1	0	1	1
10	1	1	1	1	1	1	1	1	1
11	1	1	0	1	1	1	0	1	1
12	1	0	1	1	0	1	1	1	0
13	1	0	1	1	0	1	1	1	0
14	1	0	0	1	0	1	0	1	0
15	1	0	0	1	0	1	0	1	0

FIG. 23D

N _{pilot}	Pilot bit position #	Corresponding word of length 15
2	1	C ₁
3	0	C ₁
	2	C ₂
4	1	C ₁
	3	C ₂



FIG. 23E

Bit #	N _{pilot} = 5					N _{pilot} = 6					
	0	1	2	3	4	0	1	2	3	4	5
Slot #1	1	1	1	1	0	1	1	1	1	1	0
2	0	0	1	1	0	1	0	0	1	1	0
3	0	1	1	0	1	1	0	1	1	0	1
4	0	0	1	0	0	1	0	0	1	0	0
5	1	0	1	0	1	1	1	0	1	0	1
6	1	1	1	1	0	1	1	1	1	1	0
7	1	1	1	0	0	1	1	1	1	0	0
8	1	0	1	0	0	1	1	0	1	0	0
9	0	1	1	1	0	1	0	1	1	1	0
10	1	1	1	1	1	1	1	1	1	1	1
11	0	1	1	0	1	1	0	1	1	0	1
12	1	0	1	1	1	1	1	0	1	1	1
13	1	0	1	0	0	1	1	0	1	0	0
14	0	0	1	1	1	1	0	0	1	1	1
15	0	0	1	1	1	1	0	0	1	1	1

FIG. 23F

Bit #	N _{pilot} = 7							N _{pilot} = 8							
	0	1	2	3	4	5	6	0	1	2	3	4	5	6	7
Slot #1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
2	1	0	0	1	1	0	1	1	0	1	0	1	1	1	0
3	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1
4	1	0	0	1	0	0	1	1	0	1	0	1	0	1	0
5	1	1	0	1	0	1	1	1	1	1	0	1	0	1	1
6	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
7	1	1	1	1	0	0	1	1	1	1	1	1	0	1	0
8	1	1	0	1	0	0	1	1	1	1	0	1	0	1	0
9	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	0	1	1	0	1	1	1	0	1	1	1	0	1	1
12	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1
13	1	1	0	1	0	0	1	1	1	1	0	1	0	1	0
14	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1
15	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1



FIG. 23G

N_{pilot}	Pilot bit position #	Corresponding word of length 15
5	0	C_1
	1	C_2
	3	C_3
	4	C_4
6	1	C_1
	2	C_2
	4	C_3
	5	C_4
7	1	C_1
	2	C_2
	4	C_3
	5	C_4
8	1	C_1
	3	C_2
	5	C_3
	7	C_4



FIG. 23H

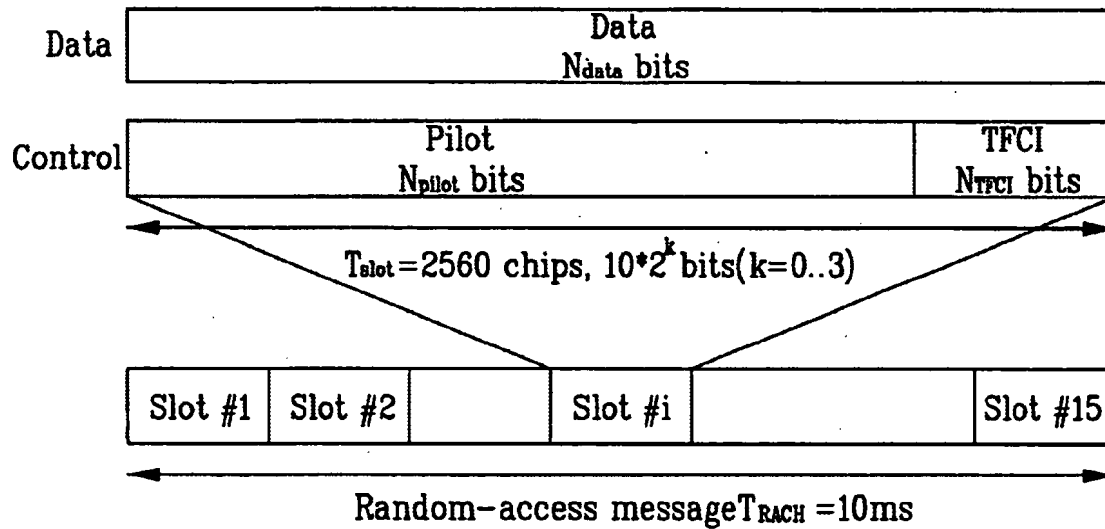


FIG. 23I

Channel Bit Rate(kbps)	Channel Symbol Rate(kcps)	SF	Bits/Frame	Bits/Slot	N_{pilot}	N_{TFCI}
15	15	256	150	10	8	2

FIG. 23J

Bit #	0	1	2	3	4	5	6	7
Slot #1	1	1	1	1	1	1	1	0
2	1	0	1	0	1	1	1	0
3	1	0	1	1	1	0	1	1
4	1	0	1	0	1	0	1	0
5	1	1	1	0	1	0	1	1
6	1	1	1	1	1	1	1	0
7	1	1	1	1	1	0	1	0
8	1	1	1	0	1	0	1	0
9	1	0	1	1	1	1	1	0
10	1	1	1	1	1	1	1	1
11	1	0	1	1	1	0	1	1
12	1	1	1	0	1	1	1	1
13	1	1	1	0	1	0	1	0
14	1	0	1	0	1	1	1	1
15	1	0	1	0	1	1	1	1

FIG. 24C

	$N_{pilot} = 4$		$N_{pilot} = 8$				$N_{pilot} = 16$							
Symbol #	0	1	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	01	10	11	00	00	10	11	00	00	10	11	00	00	10
2	10	10	11	00	00	01	11	00	00	01	11	10	00	10
3	11	10	11	11	00	00	11	11	00	00	11	10	00	11
4	10	10	11	10	00	01	11	10	00	01	11	00	00	00
5	00	10	11	11	00	11	11	11	00	11	11	01	00	10
6	01	10	11	00	00	10	11	00	00	10	11	11	00	00
7	01	10	11	10	00	10	11	10	00	10	11	01	00	11
8	00	10	11	10	00	11	11	10	00	11	11	10	00	11
9	11	10	11	00	00	00	11	00	00	00	11	01	00	01
10	01	10	11	01	00	10	11	01	00	10	11	01	00	01
11	11	10	11	11	00	00	11	11	00	00	11	00	00	10
12	00	10	11	01	00	11	11	01	00	11	11	00	00	01
13	00	10	11	10	00	11	11	10	00	11	11	11	00	00
14	10	10	11	01	00	01	11	01	00	01	11	10	00	01
15	10	10	11	01	00	01	11	01	00	01	11	11	00	11

FIG. 24D

Symbol rate	Symbol #	Channel	Corresponding word of length 15
$N_{pilot} = 4$	0	I-CH	-C ₁
		Q-CH	C ₂
$N_{pilot} = 8$	1	I-CH	-C ₃
		Q-CH	C ₄
	3	I-CH	C ₁
		Q-CH	-C ₂
$N_{pilot} = 16$	1	I-CH	-C ₃
		Q-CH	C ₄
	3	I-CH	C ₁
		Q-CH	-C ₂
	5	I-CH	-C ₇
		Q-CH	C ₈
	7	I-CH	C ₆
		Q-CH	-C ₅

FIG. 25A

Symbol #	$N_{\text{pilot}} = 8$				$N_{\text{pilot}} = 16$							
	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	11	11	10	11	11	11	10	11	11	11	10
2	11	00	11	10	11	00	11	10	11	11	11	00
3	11	01	11	01	11	01	11	01	11	10	11	00
4	11	00	11	00	11	00	11	00	11	01	11	10
5	11	10	11	01	11	10	11	01	11	11	11	11
6	11	11	11	10	11	11	11	10	11	01	11	01
7	11	11	11	00	11	11	11	00	11	10	11	11
8	11	10	11	00	11	10	11	00	11	10	11	00
9	11	01	11	10	11	01	11	10	11	00	11	11
10	11	11	11	11	11	11	11	11	11	00	11	11
11	11	01	11	01	11	01	11	01	11	11	11	10
12	11	10	11	11	11	10	11	11	11	00	11	10
13	11	10	11	00	11	10	11	00	11	01	11	01
14	11	00	11	11	11	00	11	11	11	00	11	00
15	11	00	11	11	11	00	11	11	11	10	11	01

FIG. 25B

Symbol rate	Symbol #	Channel	Corresponding word of length 15
$N_{\text{pilot}} = 8$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
$N_{\text{pilot}} = 16$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
	5	I-CH	C_5
		Q-CH	C_6
	7	I-CH	C_7
		Q-CH	C_8



FIG. 25C

Symbol #	$N_{pilot} = 8$				$N_{pilot} = 16$							
	0	1	2	3	0	1	2	3	4	5	6	7
Slot #1	11	00	00	10	11	00	00	10	11	00	00	10
2	11	00	00	01	11	00	00	01	11	10	00	10
3	11	11	00	00	11	11	00	00	11	10	00	11
4	11	10	00	01	11	10	00	01	11	00	00	00
5	11	11	00	11	11	11	00	11	11	01	00	10
6	11	00	00	10	11	00	00	10	11	11	00	00
7	11	10	00	10	11	10	00	10	11	01	00	11
8	11	10	00	11	11	10	00	11	11	10	00	11
9	11	00	00	00	11	00	00	00	11	01	00	01
10	11	01	00	10	11	01	00	10	11	01	00	01
11	11	11	00	00	11	11	00	00	11	00	00	10
12	11	01	00	11	11	01	00	11	11	00	00	01
13	11	10	00	11	11	10	00	11	11	11	00	00
14	11	01	00	01	11	01	00	01	11	10	00	01
15	11	01	00	01	11	01	00	01	11	11	00	11

FIG. 25D

Symbol rate	Symbol #	Channel	Corresponding word of length 15
$N_{pilot} = 8$	1	I-CH	-C ₃
		Q-CH	C ₄
	3	I-CH	C ₁
		Q-CH	C ₂
$N_{pilot} = 16$	1	I-CH	-C ₃
		Q-CH	C ₄
	3	I-CH	C ₁
		Q-CH	-C ₂
	5	I-CH	-C ₇
		Q-CH	C ₈
	7	I-CH	C ₆
		Q-CH	-C ₅



FIG. 26C

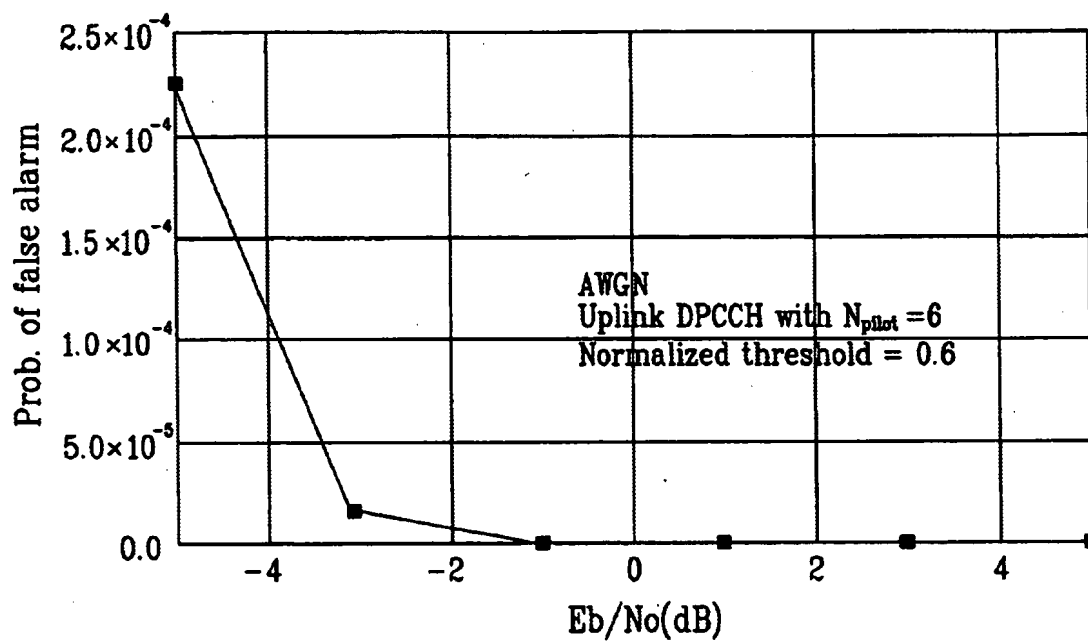


FIG. 27

Item	15 slots	16 slots
No. of slots per frame	15	16
No. of N_{pss} per slot	1) Uplink 2,3,4,5,6,7,8 2) Downlink 2,4,8,16	1) Uplink 5,6,7,8 2) Downlink 4,8,16,32
Slot-Slot possible?	Yes	Yes
Double-check possible?	Yes (Two correlators such as auto-correlator and cross-correlator are used)	Yes (Auto-correlator)
Single frame synchronization word can be used for frame synchronization?	Yes since a frame synchronization word has -1 out of -phase coefficients	May not be feasible because of +4 or -4 out-of-phase coefficients. The +4 or -4 side lobes can be zero through some particular processing using preferred pair of frame synchronization words.
Frame synchronization words	All 8 frame synchronization words are made out of a single PN code	All 8 frame synchronization words have +4 or -4 out-of-phase coefficient and minus peak value at middle shift
Autocorrelation function	$R(\tau)=15, \tau=0$ $R(\tau)=-1, \text{ elsewhere}$	$R(\tau)=16, \tau=0$ $R(\tau)=-16, \tau=8$ $R(\tau)=0, +4, \text{ or } -4, \text{ elsewhere}$

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FIG. 24A

	$N_{pilot} = 2$	$N_{pilot} = 4$	$N_{pilot} = 8$	$N_{pilot} = 16$
Symbol #	0	0 1	0 1 2 3	0 1 2 3 4 5 6 7
Slot #1	11	11 11	11 11 11 10	11 11 11 10 11 11 11 10
2	00	11 00	11 00 11 10	11 00 11 10 11 11 11 00
3	01	11 01	11 01 11 01	11 01 11 01 11 10 11 00
4	00	11 00	11 00 11 00	11 00 11 00 11 01 11 10
5	10	11 10	11 10 11 01	11 10 11 01 11 11 11 11
6	11	11 11	11 11 11 10	11 11 11 10 11 01 11 01
7	11	11 11	11 11 11 00	11 11 11 00 11 10 11 11
8	10	11 10	11 10 11 00	11 10 11 00 11 10 11 00
9	01	11 01	11 01 11 10	11 01 11 10 11 00 11 11
10	11	11 11	11 11 11 11	11 11 11 11 11 00 11 11
11	01	11 01	11 01 11 01	11 01 11 01 11 11 11 10
12	10	11 10	11 10 11 11	11 10 11 11 11 00 11 10
13	10	11 10	11 10 11 00	11 10 11 00 11 01 11 01
14	00	11 00	11 00 11 11	11 00 11 11 11 00 11 00
15	00	11 00	11 00 11 11	11 00 11 11 11 10 11 01

FIG. 24B

Symbol rate	Symbol	Channel	Corresponding word of length 15
$N_{pilot} = 2$	0	I-CH	C_1
		Q-CH	C_2
$N_{pilot} = 4$	1	I-CH	C_1
		Q-CH	C_2
$N_{pilot} = 8$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
$N_{pilot} = 16$	1	I-CH	C_1
		Q-CH	C_2
	3	I-CH	C_3
		Q-CH	C_4
	5	I-CH	C_5
		Q-CH	C_6
	7	I-CH	C_7
		Q-CH	C_8